

REMARKS

Entry of the above amendments is believed to be appropriate since they place the application clearly in condition for allowance, and reduce the number of issues for appeal.

Reconsideration of the application is respectfully requested for the following reasons:

1. Objection to Claim 19 and Rejection Under 35 USC 112

The objection to claim 19 has been addressed by amending claim 19 by changing "or" to --and--, as suggested by the Examiner.

The rejection under 35 USC 112 has been addressed by amending claim 14 to delete the phrase "or both."

2. Rejection of Claims 1-5, 13 and 18 under 35 U.S.C 102(e) as being anticipated by Lye (USP 6,566,933).

Claim 1

This rejection is respectfully traversed on the grounds that the magnitude of the "differential signal" described in the Lye patent, namely the output waveforms I1 and I2, is not determined by either the difference of the operational voltage and control voltage, or the difference of the control voltage and ground, as is not recited in claim 1. Instead, it is dependent on the current source 16 supplying current I0.

Regarding to this rejection, applicant wants to point that, in the present invention, the control voltages (V1, V2), as well as the operational voltage source (VDD) and ground (GND), are applied, via the switch circuit 30, to

control the current flowing through the first and second transistor 21, 22, and the current flowing through the third and fourth transistor 23, 24. With the currents, two of the transistors 21,22,23,24 are operated in a saturation region when the other two transistors are OFF. As such, it is able to control the magnitude of the differential signal through controlling a source-gate voltages V_{SG} of the transistors 21, 24 (i.e., $VDD-V1$ and $GND-V2$) and/or a source-gate voltages V_{SG} of the transistors 22, 23 (i.e., $VDD-V1$ and $GND-V2$).

In contrast, in the Lye patent, the output waveforms I1 and I2 of the differential pair are dependent as noted above on the current source 16 supplying current I0. The claimed operational and control voltages correspond to VDD and VMID of Lye, and ground corresponds to GND of Lye, but differential signal I1, I2 of Lye does not depend on any of the mid-rail voltages VMID, VDD, GND, and therefore the Lye patent cannot reasonably be said to teach or suggest the feature wherein "a magnitude of the differential signal is determined based on at least one of a difference of the operational voltage and the control voltage and a difference of the control voltage and the ground." Accordingly, the Lye patent does not anticipate the claim 1, and withdrawal of the rejection of claim 1 is respectfully requested.

Claim 2

Lye further fails to teach or suggest "the first transistor and the second transistor are directly coupled to the operational voltage, or the third transistor and the fourth transistor are directly coupled to the ground, or the first transistor and the second transistor are directly coupled to the operational voltage and the third transistor

and the fourth transistor are directly coupled to the ground," as recited in claim 2.

In short, Lye fails to teach or suggest all of the limitations claimed in the currently amended independent claim 1, or the limitations of claim 2. Furthermore, because claims 3-11 are dependent on claim 1, each of these claims should be allowed if claim 1 is found allowable.

Claim 12

The rejection of amended independent claim 12 is respectfully traversed on the grounds that the Lye patent and the Cook patent each fails to teach or suggest "at least one of the currents of the first, the second, the third, the fourth transistors is generated, the at least one of the first, the second, the third, the fourth transistors operates at a saturation region," as presently recited in claim 12. Accordingly, Applicants believe that independent claim 12 has been placed in condition for allowance. Claims 13-18 are dependent on claim 12, and should be allowed if claim 12 is found allowable.

3. Rejection of Claims 14-22 under 35 U.S.C 102(e) as being anticipated by Cook et al (USP 6,788,116).

This rejection is respectfully traversed on the grounds that the Cook patent fails to disclose or suggest the claimed control of the first to fourth transistors, and in particular a first transistor coupled to an operation voltage source for receiving one of a first control signal and third control signal, a second transistor coupled to an operational voltage source. . . , and so forth. The first and second transistors of Cook are not coupled to the operational voltage source Vdd, but rather to transistor M0, and always receives both the control signal Vina and

the signal at the junction node of transistors. Furthermore, the Cook patent fails to disclose or suggest the direct connections of the third and fourth transistors to ground, the third and fourth transistors of Cook instead being connected to receive both the control signal Vinb and the signal at the VSS/GND terminal.

More specifically, the Examiner states that figure 1 of Cook et al. shows a first transistor (M1) coupled to an operational voltage source (Vdd) for receiving one of a first control signal (Vina) and a third control signal (signal at the junction node of transistors M1-M2, M0); a second transistor (M2) coupled to the operational voltage source (Vdd) for receiving one of the first control signal (Vina) and the third control signal (signal at the junction node of transistors M1-M2, M0); a third transistor (M3) coupled between the first transistor (M1) and ground (VSS/GND) for receiving one of a second control signal (Vinb) and a fourth control signal (signal at the VSS/GND terminal); a fourth transistor (M4) coupled between the second transistor (M1) and ground (VSS/GND) for receiving one of the second control signal (Vinb) and the fourth control signal (signal at the VSS/GND terminal).

However, from figure 1 of Cook et al., we can see that the first transistor (M1) is coupled to a transistor M0 but not an operational voltage source (Vdd) and always receives both the control signal (Vina) and the signal at the junction node of transistors M1-M2, M0, instead of only receiving one of them; the second transistor (M2) is coupled to the transistor M0 but not an operational voltage source (Vdd) and always receives both the control signal (Vina) and the signal at the junction node of transistors M1-M2, M0, instead of only receiving one of them; the third transistor (M3) always receives both the control signal (Vinb) and the signal at the VSS/GND terminal, instead of

only receiving one of them; the fourth transistor (M4) always receives both the control signal (Vinb) and the signal at the VSS/GND terminal, instead of only receiving one of them. Therefore, control of the first to fourth transistors 21-24 of the present invention is different from that to the transistors M1-M4 of Cook, and the Cook patent therefore does not anticipate claim 12.

Claims 14-18

Because the Cook patent fails to teach or suggest "at least one of the currents of the first, the second, the third, the fourth transistors is generated, the at least one of the first, the second, the third, the fourth transistors operates at a saturation region." Applicants believe claim 12 has been placed in condition for allowance. Claims 14-18 is dependent on claim 12, and should be allowed if claim 12 is found allowable.

Claim 19-22

Independent claim 19 of the present application has been amended to recite the first and second transistors being directly coupled to the operational voltage source and the third and fourth transistors being directly coupled to ground, as discussed above. Applicants therefore believe that claim 19 has been placed in condition for allowance for at least the same reasons as claim 12. Claims 20-22 are dependent on claim 19, and should be allowed if claim 19 is found allowable.

4. Rejection of Claims 19-21 and 23 under 35 U.S.C 102(e) as being anticipated by Hass (USP 6,720,805).

This rejection is respectfully traversed on the grounds that the Hass patent fails to disclose or suggest a differential signal output circuit in which a transistor

corresponding to the claimed first transistor receives a signal corresponding to the claimed third control signal, a transistor corresponding to the claimed second transistor receives a signal corresponding to the claimed first control signal, a transistor corresponding to the claimed third transistor receives a signal corresponding to the claimed fourth control signal, and a transistor corresponding to the claimed fourth transistor receives a signal corresponding to the claimed third control signal.

The Examiner states that Figure 1A of the Hass reference shows a first transistor (M1) coupled to an operational voltage source (Vdd) for receiving one of a first control signal and a third control signal (A,AN); a second transistor (M2) coupled to the operational voltage source (Vdd) for receiving one of the first control signal and the third control signal (A,AN); a third transistor (M3) coupled between the first transistor (M1) and ground (VSS) for receiving one of a second control signal and a fourth control signal (BN,B); a fourth transistor (M4) coupled between the second transistor (M1) and ground (VSS) for receiving one of the second control signal and the fourth control signal (BN,B).

However, from Figure 1A of Hass reference, we can find that the first transistor (M1) always receives the first control signal (A) and never receives the third control signal (AN); the second transistor (M2) never receives the first control signal (A) and always receives the third control signal (AN); the third transistor (M3) always receives the third control signal (BN) and never receives the fourth control signal (B); the second transistor (M4) never receives the third control signal (BN) and always receives the fourth control signal (B). As a result, the

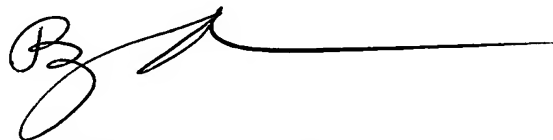
Hass patent cannot be said to anticipate the claimed invention (no which transistors are designated as "first," "second," and so forth), and therefore withdrawal of the rejection of claims 19-21 and 23 under 35 USC 102(b) is respectfully requested. Claims 20-21 and 23 are dependent on claim 19, and should be allowed if claim 19 is found allowable.

CONCLUSION

In view of the foregoing remarks, reconsideration and allowance of the application are now believed to be in order, and such action is hereby solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

BACON & THOMAS, PLLC

A handwritten signature in dark ink, appearing to be 'B. Urcia', with a long horizontal line extending to the right.

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